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# MULTIMEDIA UNIVERSITY

## FINAL EXAMINATION

TRIMESTER 1, 2018/2019

### TSA2151 SYSTEM ADMINISTRATION AND MAINTENANCE

(All Sections / Groups)

17 OCTOBER 2018  
9.00 AM – 11.00 AM  
(2 Hours)

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#### INSTRUCTIONS TO STUDENTS

1. This question paper consists of 6 pages including cover page.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Write all your answers **CLEARLY** in the Answer Booklet provided.

**Question 1**

- A. Linux is a powerful operating system that can run on almost any computer hardware. Identify any FOUR (4) components of Linux Operating System. (4 marks)
- B. An open-source license is a type of license for computer software and other products that allows the source code, blueprint or design to be used, modified and/or shared under defined terms and conditions. List TWO (2) open-source licenses related to Linux and their applications. (2 marks)
- C. Discuss THREE (3) types of file permission under Linux. (3 marks)
- D. Give suitable command to change file permission. (1 mark)

**Question 2**

- A. Most of the DNS servers in the world are run by the Berkeley Internet Name Daemon, or BIND. BIND is standard on every version of Unix and Linux. Identify and explain THREE (3) components of BIND. (3 marks)
- B. ISPConfig is an open source hosting control panel for Linux, licensed under BSD license. It provides different level of privileges to different group of users. Differentiate TWO (2) privileges for reseller and customer. (4 marks)
- C. File Transfer Protocol (FTP) is one of the oldest and most commonly used protocols found on the Internet today. Its purpose is to reliably transfer files between computer hosts on a network.
- i. List TWO (2) ways to manage access for FTP Server. (2 marks)
- ii. Give an apt command to install a FTP server named proftpd-basic (1 mark)

**Question 3**

- A. It's important to choose the right systems to migrate since some applications are better suited to virtualization than others. Services that already have high utilization might be better left on a physical system. Suggest FOUR (4) system or applications that are consider good candidates for virtualization. (4 marks)
- B. Define web server benchmarking and give ONE (1) web server benchmarking tools. (2 marks)

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- C. Apache2 is configured by placing directives in plain text configuration files. These directives are separated between the files and directories. Based on the description below, identify the name for a file or directory that most suite for that directive. (4 marks)

No	File or Directory	Description
i		The main Apache2 configuration file. Contains settings that are global to Apache2.
ii		This directory contains configuration files to both load modules and configure them.
iii		holds symlinks to the files in /etc/apache2/mods-available. When a module configuration file is symlinked it will be enabled the next time apache2 is restarted.
iv		Houses the directives that determine which TCP ports Apache2 is listening on.

#### Question 4

- A. Briefly discuss BASH scripting and identify THREE (3) characteristic of their variable. (4 marks)
- B. Write a BASH script based on the output below. (3 marks)

```
linux@ubuntu: ~/Documents/2018-2019-Tri1/Li
% bash distro.sh
What Linux distro do you like?
Ubuntu Debian Redhat
Your first distro was: Ubuntu
Your second distro was: Debian
Your third distro was: Redhat
% █
```

- C. Amanda Stands for (Advanced Maryland Automatic Network Disk Archiver) which is very useful backup tool designed to backup and archive computers on the network to disk, tape or cloud. List THREE (3) features of Amanda as backup tools for Sysadmin. (3 marks)

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**Question 5****Case Study: LAMP**

LAMP is an acronym taken from the initial letters of a set of free software programs commonly used together to run dynamic Web sites or servers. The components are Linux, Apache and MySQL, with the final “P” standing for any of three scripting languages: PHP, Perl or Python.

In the jargon-laden world of IT, new terms are created as shorthand ways of referencing or discussing otherwise cumbersome phrases. One addition to the lexicon that has gained increased popularity and use is LAMP, which refers to a group of free, largely open-source software that forms the basis of many — maybe most — Web servers in use today. LAMP has four components: Linux, Apache, MySQL and Perl, PHP and/or Python. (There are often variations on Linux and MySQL as well.)

While these programs were not specifically designed to work with one another, the open-source ethos and community-based development efforts made interoperability a strong focus and helped make this combination a popular and highly reliable choice. The fact that all are available to use for free didn’t hurt either.

In brief, here are the elements that make up LAMP.

Linux is, of course, the open-source operating system kernel originally created by Linus Torvalds and based loosely on Unix. From its university student, hobbyist roots, Linux has become a family of highly reliable operating systems that are used by both large and small organizations worldwide.

Thanks to the large open-source development community for the operating system kernel itself, individual development groups for the many different distributions, and a number of commercial versions that are supported by credible vendors, Linux is regarded as a safe, reliable choice for many server applications.

Apache is, hands down, the most widely used Web server on the planet. Apache has been an open-source effort from its beginnings around 1995 and is controlled by a group called The Apache Software Foundation. As of August 2006, according to a survey by Netcraft Ltd., Apache served 62% of all Web sites on the Internet and is clearly the world’s most popular Web server, although in recent months it has been losing market share to Microsoft Corp.’s Internet Information Server. Still, Apache remains the de facto reference platform against which all other Web servers are judged.

MySQL is a multithreaded, multiuser, SQL-based database management system with more than 6 million installations. Unlike the other components, MySQL is not open-source but has been copyrighted and owned by a single for-profit company since its 1995 inception. Uppsala, Sweden-based developer MySQL AB makes it available as free software under the GNU General Public License but also dual-licenses it under more traditional, proprietary arrangements in situations where the intended use is incompatible with the GPL.

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PHP, Perl and Python are the programming languages of choice in most LAMP and LAMP-like installations. Besides starting with the same letter of the alphabet, all are characterized as concise, compact scripting languages that can allow a user to execute a program on the Web server from within a browser window.

The use of scripting languages started with the Common Gateway Interface Web interfaces of the early 1990s, simplifying the delivery of Web pages with dynamic, updated content in addition to static, unchanging pages. Programmers preferred scripting languages for these applications because they made it relatively easy to manipulate text streams from a variety of sources.

The acronym LAMP was coined by writer Michael Kunze in an article in the December 1998 issue of German computing magazine Computertechnik. Kunze was trying to show that a bundle of free software could be a feasible alternative to expensive commercial packages. Since then, publisher O'Reilly & Associates and MySQL have worked to popularize the term.

### **Platform or App Stack?**

Many refer to LAMP as a stack, a layered grouping of basic business software. These layers are comparable with the ones that make up commercial stacks like Microsoft's .Net framework. When used in combination, they support application servers.

Competing stacks of commercial middleware include unified application development environments such as .Net, IBM's WebSphere, Apple Computer Inc.'s WebObjects and Sun Microsystems Inc.'s Java Enterprise Edition. But whether we call LAMP a stack or a platform, it clearly qualifies as having an interlocking set of technologies on which developers can build and deploy applications.

Is LAMP ready for use inside the enterprise? Yes and no. It's already used to run high-volume Web sites, such as the O'Reilly Network. Major chunks of Internet giants such as Amazon.com Inc. and Google Inc. use LAMP systems and networks. But you probably wouldn't want to run your core financial systems on LAMP; until recently, MySQL didn't even understand the notion of a transaction.

By itself, LAMP really only defines software for Web applications. Although you can use it to build an application that connects to sophisticated middleware, the heavy-duty programming would likely have to be done in a different language.

The .Net and Java platforms, in contrast, offer a way of writing both Web scripts and complex enterprise applications in the same language.

Still, LAMP is likely to be popular with price-conscious organizations that have strong internal development efforts and are comfortable with peer-based support. Does that fit your company's environment and culture?

Reference:

<https://www.computerworld.com/article/2553939/app-development/lamp.html>

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**Questions**

- A. LAMP is an acronym taken from the initial letters. Identify the component based on each initial letters. (2 marks)
- B. Apache is the most widely used Web server on the planet. Give some evident based on the case study. (1 mark)
- C. Which components of LAMP is NOT open-source software and explain how did they make it open- source and copyrighted at the same time? (2 marks)
- D. Why many IT professional consider LAMP as application stack? Give a comparable commercial stack that is available in the market. (2 marks)
- E. Identify TWO (2) commercial middleware stacks. (2 marks)
- F. Why may some people still consider LAMP as not suitable for enterprise usage although Internet giants such as Amazon.com Inc. and Google Inc. use LAMP systems? (1 mark)

**End of Paper**